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MultiView
XR2000
Receiver

Quick Reference
&
Setup Guide

Magenta Research

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This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

EUROPEAN UNION DECLARATION OF CONFORMITY

The manufacturer declares that this product meets the requirements of EU Directive 89/336/EEC.

CE

Contents

Chapter **Page**

1. Specifications.....3

2. Introduction 4
2.1 Overview.....4
2.2 Equipment You May Also Need.....4
2.3 Compatible Cabling 4

3. Setup and Installation.....5
3.1 Data Mode Configuration.....5
3.2 Cabling Considerations.....5
3.3 Making the Connections.....5
3.3.1 Connections and Setup in General 5
3.3.2 Connections on the Single-Port VGA/Audio.....6
3.3.4 Connections on the Single-Port SA/SAP version.....7
3.4 Video Adjustment.....8
3.4.1 Cable Distance Compensation Settings.....8
3.4.2 Skew Compensation Settings.....9

4. Troubleshooting.....10
4.1 Common Problems 10

Appendix A. Cabling Pinouts.....12

Appendix B. XR-2000 Configuration Settings.....14

Appendix C. Setting Sync Modes.....16

Appendix D. Skew Module.....17

Appendix E. Mounting Options.....18

Appendix F. Pollable Serial Mode.....19

1. Specifications

Cable Required: Category 5, 5e, 6 shielded or unshielded twisted pair
Compliance: CE; FCC Class A, IC Class A

Video Support: QVGA, VGA, SVGA, XGA, SXGA, UXGA, RGBHV, RGB, Composite (NTSC, PAL, SECAM), S-Video, Component Video, widescreen modes, HDTV modes including 1080p, 1080i, 720p

Resolution and Refresh Rate: At 2000 ft. (609 m) or less: to 1920x1200

Required Source Impedance: Video OUT: 75 ohms;
Audio models: Audio OUT (if any): 600 ohms maximum

Required Destination Impedance: Video IN: 75 ohms;
Audio models: Audio IN (if any): 600 ohms minimum

Audio Characteristics: Right/Left summed (A option)
XR2000SA/SAP: Full Stereo
Line Level 600 Ohm Unbalanced

Serial Characteristics: Protocol: Asynchronous; transparent to data format;
data rates to 115 kbps simplex, half-duplex modes
SA/SAP versions are 3 wire, fixed baud rate of 9600

Connectors: (1) 4 pin phoenix, (2) RJ-45, (1) HD15 F; (1) DB9M (model dependent)

Temperature Tolerance: Operating: 32 to 104°F (0 to 40°C);
Storage: -4 to +140°F (-20 to +60°C)

Humidity Tolerance: Up to 80% noncondensing

Enclosure: Steel
Power: +12 VDC; 1.2 A
Consumption: 6 watts maximum

Size: 1.2"H x 5.6"W x 6.2"D (3.0 x 14.2 x 15.7 cm)

Weight: 2.0 lb. (0.9 kg)

2. Introduction

2.1 Overview

The Magenta MultiView Series extends video, audio and serial signals over ordinary Category 5 cable.

This manual covers Magenta MultiView Series XR2000 Receivers. These units are field configurable for various video, audio and serial options. See Appendix B for configuration settings.
SA series feature video, stereo audio and RS-232 signals on a single cat5.
SAP series units are similar to the above but have additional features for pollable serial.

The Magenta MultiView Series XR Receivers feature optional integrated skew compensation that can be varied in 2 ns increments to 65 ns total per color channel to cancel the effects of skew in Category cables. This feature allows you to use CAT5e and reduced-skew CAT6 cables to lengths up to 2000 ft.

For information on the respective transmitter unit, please refer to the appropriate manual included with the transmitter.

All models support refresh rates/resolutions up to 1920 x 1200 @ 60 Hz to 2000 feet (609 m) and 2048 x 1536 @ 70 Hz to 1000 feet (305 m).

WARNING

This equipment is not intended for, nor does it support, distribution through an Ethernet network. Do not connect these devices to any sort of networking or telecommunications equipment!

2.2 Equipment You May Also Need

- Audio cable with RCA jacks.
- Video cable with HD15 connectors
- Serial cable with DB9 connectors.
- CAT5 cable.

2.3 Compatible Cabling

Magenta Research products are compatible with Cat5/5e/6 data cabling as well as skew free CAT5/5e cabling manufactured for video applications. Note that some skew free Cat5 is specific to a particular vendor and is not compatible with our products. Please ensure any skew free CAT5 cable is non-proprietary prior to purchase/ installation.
CAT6 cable, due to the manufacture method, can exhibit much greater skew than standard CAT5/5e and may require skew compensation beyond what the standard product offers. Please contact Magenta Research for assistance.
CAT5/5e/6 cabling for the Magenta MultiView Series must be pinned to the TIA-EIA T568B wiring specification (see appendix A) We also highly recommend that all CAT5 cables be pre-terminated and tested. Cables terminated on-site or in an existing infrastructure should be tested before use to ensure compliance with the TIA-EIA T568B specification. Using incorrectly terminated CAT5 cables can damage the Magenta MultiView Series.
.

3. Setup and Installation

3.1 Data Mode Configuration

SA series offer RS232 serial in addition to stereo audio. The serial signal is 3 wire TX, RX, GND and does not support full modem signals. Baud rates for the SA series are fixed at 9600. Simplex modes are supported without jumper or other changes by simply using the TX signal only. SA units require no configuration.

SAP series offer pollable RS232 serial in addition to stereo audio. The serial signal is 3 wire TX, RX, GND and does not support full modem signals. Baud rates for the SAP series are fixed at 9600. Simplex modes are supported without jumper or other changes by simply using the TX signal only. See Appendix F on configuration and use of SAP Series.

3.2 Cabling Considerations

• We recommend mounting and connecting all cabling to the Magenta MultiView Series components before applying power.
• Makes sure that the CAT5 cable you intend to use has been tested to comply with the TIA/EIA 568B wiring specification (See **Appendix A**).

3.3 Making the Connections

3.3.1 CONNECTIONS AND SETUP IN GENERAL

This section contains figures showing connections with the specific Magenta MultiView Series models. In general, however, the connection and setup procedure at both transmitter and receiver ends is as follows:

NOTE: all units must be the same type for all supported features to function correctly. For example, a UTX set for R/L summed audio must be connected to an XR2000 set for R/L summed audio. Similarly, A UTX SA cannot be used with an XR2000A. Video modes may function normally, but 4th pair options will not.

At the transmitter end (refer to the transmitter user guide) :

1. Connect the source video to the Magenta MultiView Series transmitter video input port, which is an HD15 connector labeled SOURCE IN.

2. If desired, attach a local monitor via the local monitor port to LOCAL OUT

3. Make your audio or serial connections via the phoenix connector or DB9 connector as appropriate.

4. Connect the CAT5 cable to the transmitter.

5. Apply power on the transmitter. The LED should light and, if there's a local monitor attached, a video image should appear on the monitor's screen.

At the receiver end:

1. Connect the VIDEO OUT HD15 connector to the display unit, and attach any audio (AUX I/O) or serial connections (IOIO) depending on the model of MultiView CAT5 Video System.

2. Connect the CAT5 cable to the LINK INPUT connection. If daisy chaining units, connect the output CAT5 cable to the LINK OUTPUT connection.

3. Apply power. *****NOTE: XR2000 units utilize 12VDC ***** The LED should light and video should appear on the display (make sure display is powered ON).

4. To adjust video levels and skew compensation see **Section 3.4**.

5. Please mount the XR2000 in a location that ensures the ventilation holes and fan are not blocked.

3.3.2 CONNECTIONS ON THE SINGLE-PORT VGA/AUDIO

The single-port units with audio support video and audio signals over CAT5 cable. The audio signal is line-level summed Right/Left audio, and powered speakers are required. Note that there's a single connection for audio input. You can also use the transmitters and receivers to make video-only connections without audio. Figure 3-1 shows the Single-Port MultiView CAT5 Video System with Audio Transmitter connections, and Figure 3-2 shows the receiver connections.

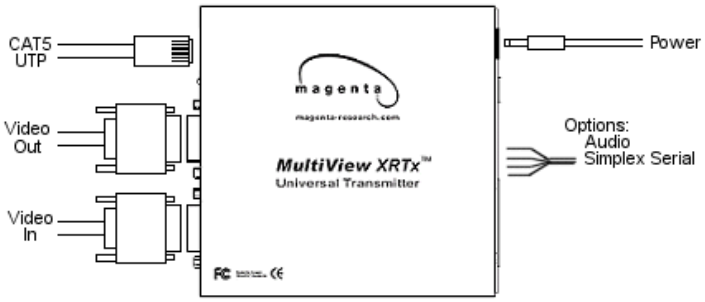


Figure 3-1. Connections on the XRTx Universal Transmitter.

Figure 3-2. Connections on the XR2000 for video and audio.

3.3.3 CONNECTIONS ON THE SINGLE-PORT VGA SA and SAP

The Single-Port MultiView™ CAT5 Video System SA/SAP series supports RS-232, video and stereo audio signals over CAT5 cable. SAP offers pollable serial modes so a bi-directional serial session can be established with a receiver in a daisy chain.
At this time the Magenta MultiView units that support the SA/SAP versions are the Magenta MultiView XRTx Universal Transmitter, AK600, AK1200,and XR2000 receivers. The Magenta MultiView T4, T5 transmitters do not support SA/SAP versions.
In order to utilize the full potential of the Magenta MultiView SA/SAP series, all transmitters and receivers must be SA/SAP versions.
You cannot connect a standard RS232 or L/R audio version to an SA/SAP version to get a single serial or audio signal. Video modes are not affected by this.
Serial signals are 3 wire RS232 (Tx, Rx, ground) and fixed at 9600 baud. Full 9 pin modem signals are not supported.
Note when using the Magenta MultiView SA/SAP series with a MultiView 9D Cat5 DA, or Cat5 matrix switch, the serial is transmit only. There are no configuration changes required to the units. The serial application in use should be changed to transmit only.
Audio is full stereo, line level. One or two separate channels of mono audio may also be used.
See figures below for cabling connections.
Appendix F details the configuration and use of the SAP series.

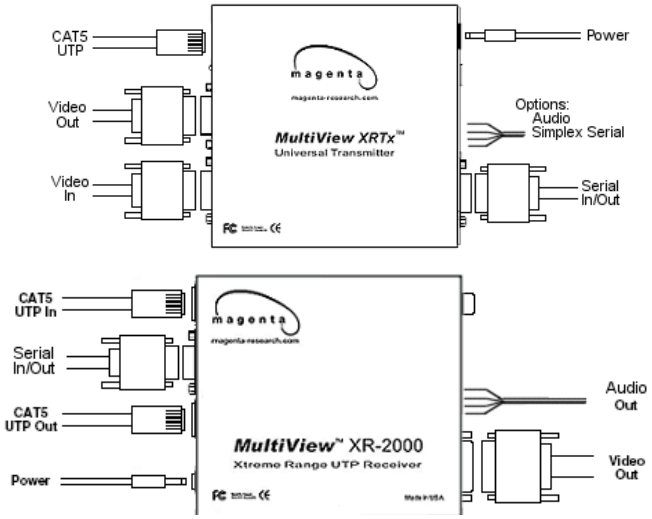


Figure 3-3: SA & SAP connections

NOTE

SA units are pre-configured from the factory and require no configuration changes. SAP Units require unique addresses when pollable serial is used. See Appendix F.

3.4 Video Adjustment

3.4.1 Cable Distance Compensation Settings

In order to get the highest quality video signals from your MultiView CAT5 Video System , please follow the instructions and diagrams below:
An Image Adjustment Utility is available for download from:
http:// www.magenta-research.com/test
Simply open in any image browser on a computer.
If the image file can not be downloaded, use a utility to draw a black box on a white background.

NOTE: TURN KNOB SLOWLY DURING ADJUSMENT PROCEDURE. Turning too fast may result in missing the proper EQ setting resulting in picture loss.

To Reset EQ and Skew values to 0, remove power from XR2000, Push and hold EQ/Skew Knob in and re-apply power.

1. Push EQ/Skew knob in once so that all three RGB LED's are on with red, green, and blue colors.
2. Turn the EQ/Skew knob clockwise until the shadow next to the black box just disappears. The brightness in the white area should be the same as the white area above and below the black box. The Cable Length LED's will turn on for indicated cable distances. Starting from zero feet to 1,000 and above may take some time. Please continue turning the knob for best picture quality.
3. Press and release EQ/Skew knob until RGB LEDs are all off.

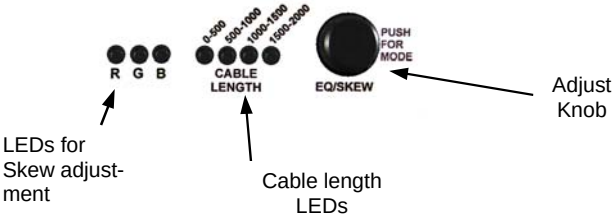


Figure 3-9: Adjustment locations

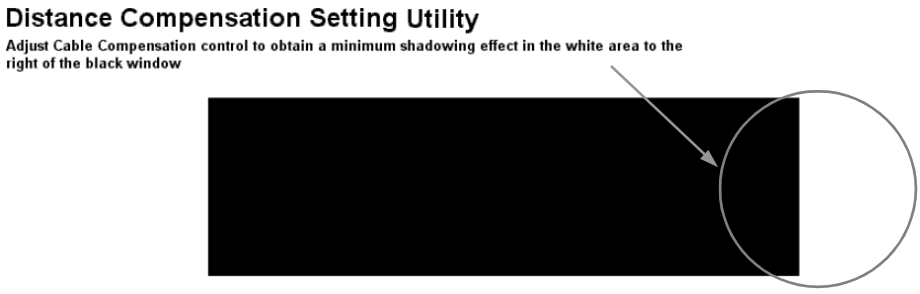

Distance Compensation Setting Utility
Adjust Cable Compensation control to obtain a minimum shadowing effect in the white area to the right of the black window

Figure 3-4: Image Adjustment Utility—Cable Length EQ

3.4.2 Skew Compensation Settings

The XR2000 receiver is available with an optional skew compensation module to adjust for signal timing differences due to differing pair lengths within the CAT5 cable. Using the delay signals, skew may be compensated from 2 to 65 nanoseconds in 2 nanosecond increments on each individual color pair.
If skew compensation is required, but the skew comp module is not installed, call for technical assistance.

An image file is available to assist in these settings (see Section 3.4.1 for details). See Figure 3-5 for an example.

1. To adjust individual colors, press the EQ/Skew knob until the desired color LED is on for the RGB Skew LEDs to the left of the cable length LEDs. The R LED is for the Red color channel, G LED is for green and the B LED is for blue.
2. Using the image utility, turn knob to add/subtract delay timing until a single vertically aligned line of red, green, blue is obtained.
3. When complete press EQ/Skew knob until RGB LEDs are all off.

Not all colors will have the same delay settings.

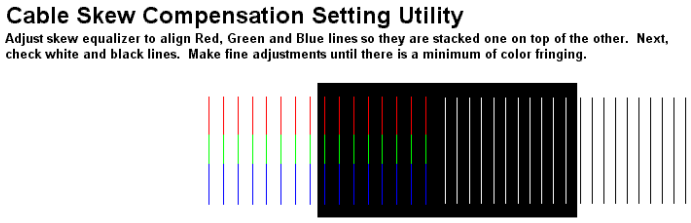

Cable Skew Compensation Setting Utility
Adjust skew equalizer to align Red, Green and Blue lines so they are stacked one on top of the other. Next, check white and black lines. Make fine adjustments until there is a minimum of color fringing.

Figure 3-5: Image Adjustment Utility—Skew

4. Troubleshooting

4.1. Common Problems

In most cases, nearly every issue with the MultiView CAT5 Video System can be resolved by checking the CAT5 termination and making sure that it's pinned to the TIA/EIA 568B wiring specification. However, there may be other problems that cause the system to not perform as it's designed. Below are solutions to the most common installation errors.

Problem: No video signal at the transmitter local port or at the receiver.
Solution:
- Check that both units are powered.
- Ensure EQ adjustment is set correctly — turn knob slowly.
- Make sure the CAT5 cable is terminated correctly per the TIA/EIA 568B wiring specification.
- Is the display device powered on and functioning? Check to ensure display settings (resolution, refresh rate, etc) are compatible with input signal.

Problem: Poor video quality:
Solution:
- Have all receiver adjustments been finished (see section 3.4).
- Ensure EQ adjustment is set correctly — turn knob slowly.
- Check all cable connections.
- The video signal's refresh rate may be set too high. Reset to a lower refresh rate in your monitor-configuration menu.
- There may be a delay skew issue. See Section on Skew.

Problem: Poor audio quality:
Solution:
- Powered speakers are required. Make sure speaker power is ON.
- Check input source levels from the source device. Make sure the audio source is not overdriven or underdriven.
- Audio is summed left and right for "A" versions. If using a single channel, both audio inputs must be connected at the transmitter end for full audio gain. Audio is line level.
- If Daisy Chaining, audio termination must be removed in DP units. Only the last receiver requires termination. Set the external TERM switch to ON/OFF as required. This does not apply to SA or SAP units (SA units no longer require separate daisy chain or end of line units as of April 2009).
- If Daisy Chaining, audio termination must be removed in DP units. Only the last receiver requires termination.

Problem: **"**Green shift" or "green washout" on multimedia signals.
Solution: The standard video/serial model is designed to function with DC coupled signals in which the black level is referenced to 0 volts. Nearly all VGA cards function this way.
Some media servers, however, provide AC coupled signals and can cause a green color shift in the video. This is a result of the sync clamping on the red and blue channels of the video/serial model.
For five-component (RGB/H&V) AC coupled video, the MultiView CAT5 XRTx Universal transmitter has been designed with full DC restoration capability. This problem is easily solved via a simple switch setting in the XRTx Transmitter. Please refer to the XRTx Transmitter user manual.

Problem: **Notes on Daisy Chaining:**
Solution: When daisy chaining, the maximum cable distance is not increased beyond the rated distance of the receiver used. For example, an AK600 can only daisy chain within 600 ft of the transmitter.
It is possible to daisy chain out of a short range receiver into a longer range receiver to increase the range. For example, over 600 ft an AK600 can be daisy chained into an AK1200 which allows for daisy chaining to 1,200 ft.

- If using L/R summed audio, simplex serial, or SPDIF units a maximum of 12 units may be daisy changed within the rated cable length of the receiver.
- When using SA units, a maximum of 4 units may be daisy chained within the rated cable length of the receiver.
- When using SAP units, a maximum of 12 units may be daisy chained within the rated cable length of the receiver if using standard cat5/6 or a maximum of 8 units may be daisy chained within the rated cable length of the receiver if using skew-free cable

Appendix A. Cabling Pinouts

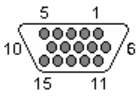


Table A-1. HD15 video connector.

Pin	RGBHV (VGA)	RGBS	RGsB	Com-posite	SVHS (Y/C)	YUV
1	Red +	Red +	Red +		C+	V+
2	Green+	Green+	Green+	C+	Y+	Y+
3	Blue+	Blue+	Blue+			U+
4	—	—	—			
5	Gnd	Gnd	Gnd			
6	Red-	Red-	Red-		C-	V-
7	Green-	Green-	Green-	C-	Y-	Y-
8	Blue-	Blue-	Blue-			U-
9	—	—	—			
10	Gnd	Gnd	—			
11	Gnd	Gnd	—			
12	—	—	—			
13	H Sync	C Sync	—			
14	V Sync	—	—			
15	Gnd	Gnd	—			

Table A-2. Phoenix Connection

PIN	Audio	SA / SAP Audio	Simplex Serial	SPDIF Audio	Composite Video
Pin 1	Left Channel	Right Channel	Tx	Signal +	Signal +
Pin 2	Ground	Ground	ground	Signal -	Signal -
Pin 3	Right Channel	Left Channel	-	-	-
Pin 4	-		Shell	-	-

Note: Typically Channel 1 is left audio and Channel 2 is right audio.
SA series units use Channel 1 for Right audio and channel 2 for left audio.

Appendix A. Cabling Pinouts

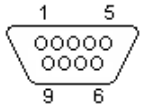
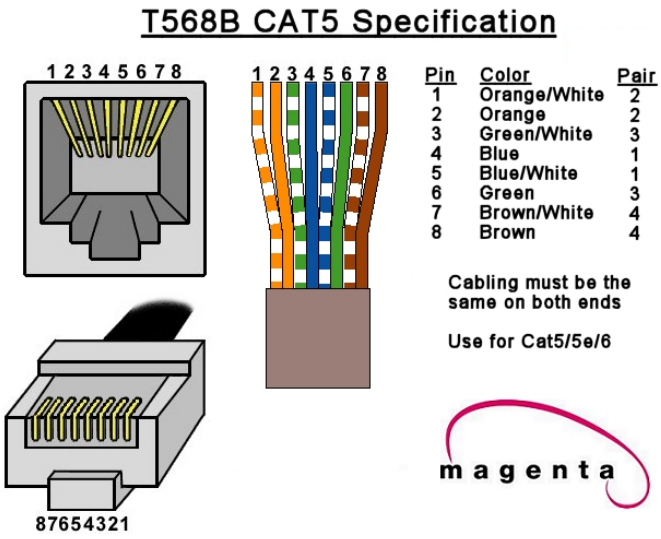


Table A-3. DB9 Male Serial connector

Pin	3 wire (SA/SAP)	Simplex
1		
2	RX	
3	TX	TX
4		
5	Ground	Ground
6		
7		
8		
9		

Table A-4. T568B CAT5 pinout



Appendix B. XR2000 Configuration Settings

Note: XR2000 receivers are typically pre-configured at time of order and will have factory configuration indicated on the bottom of the unit.

The factory configuration may be changed or checked by using the following jumper location diagram as well as Table B-1 for jumper settings.

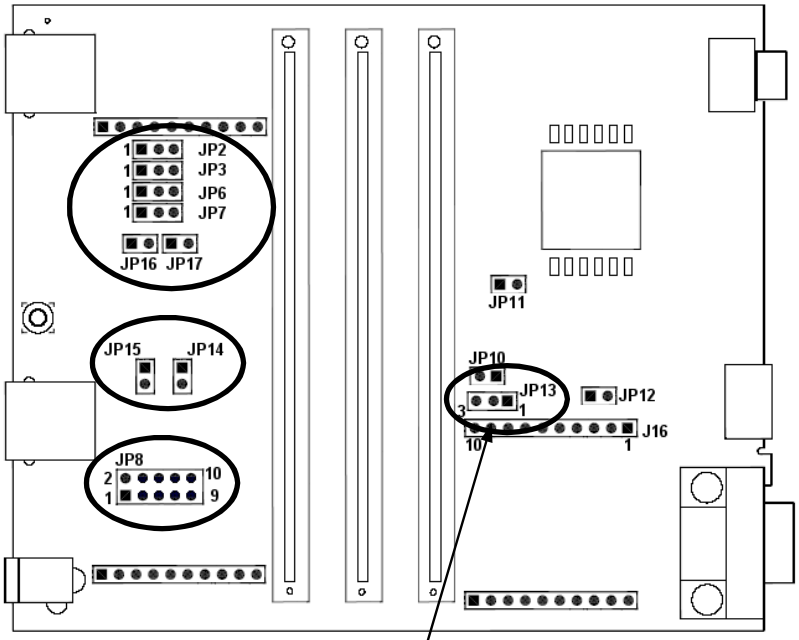


Figure B-1. XR2000 Jumper locations.

JP13 controls sync clamping circuitry and has 3 settings depending on the video signal in use:
RGBHV computer video with separate horizontal and vertical sync == JP13 1-2
Non RGBHV computer video, component RGB/YUV, S-video, composite video or RGsB video == JP13 2-3
Auto sense video mode == JP13 non-jumpered.

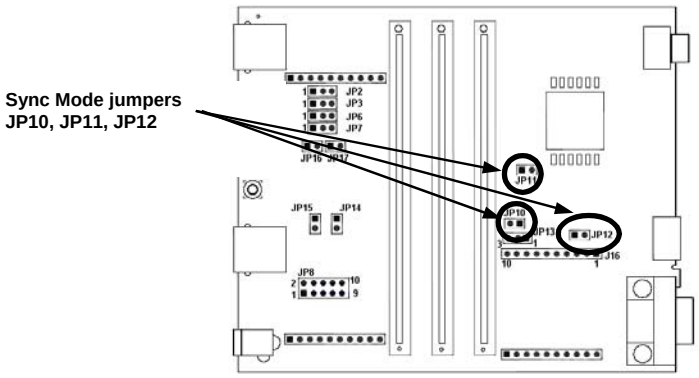
Table B-1: MultiView XR2000 Configuration Jumper Settings

Configuration Option (all options utilize 4th pair):	JP2	JP3	JP6	JP7	JP8	JP14	JP15	JP13	JP16	JP17
RGBHV Computer Video (see note below on daisy chaining)										
With Left/Right Line Level Audio	1-2	1-2	1-2	1-2	3-4 5-6	out	out	1-2	IN	IN
With SDPIF Digital Audio	1-2	1-2	1-2	1-2	3-4	IN	out	1-2	IN	IN
With Simplex Serial (receive only)	1-2	1-2	1-2	1-2	1-2	out	IN	1-2	IN	IN
With Composite Video	1-2	1-2	1-2	1-2	3-4	IN	out	1-2	IN	IN
With RS 232 serial or SA/SAP series (requires separate daughterboard installed)	2-3	2-3	2-3	2-3	out	out	out	1-2	out	out
Composite, S-Video, Component Video (see note below on daisy chaining)										
With Left/Right Line Level Audio	1-2	1-2	1-2	1-2	3-4 5-6	out	out	2-3	IN	IN
With SDPIF Digital Audio	1-2	1-2	1-2	1-2	3-4	IN	out	2-3	IN	IN
With Simplex Serial (receive only)	1-2	1-2	1-2	1-2	1-2	out	IN	2-3	IN	IN
With Composite Video	1-2	1-2	1-2	1-2	3-4	IN	out	2-3	IN	IN
With RS 232 serial or SA/SAP series (requires separate daughterboard installed)	2-3 1-2	2-3 1-2	2-3	2-3	out	out	out	2-3	out	out
Dual Port Daisy Chain units										
***Use configuration above, but remove JP16 & JP17 (see last unit note below).**	*	*	*	*	*	*	*	*	**OUT**	**OUT**
For DP versions, *the last unit in chain* requires JP16, JP17 IN *except* if units are SA, or SAP versions.	*	*	*	*	*	*	*	*	**IN**	**IN**

Appendix C. Setting Sync Mode

The XR2000 has the capability for fixed and agile sync. The default sync mode setting is for agile sync which replicates the source sync polarity signals. However some displays require a fixed sync polarity that is not possible to change at the video source. The following details jumper settings to change the sync polarity of the horizontal and vertical sync signals (Note that jumpers JP11 and JP12 have no affect in agile mode):

Jumper Setting	JP10	JP11	JP12
Fixed Sync	IN	-	-
Agile Sync (default)	OUT	-	-
Horizontal Sync Positive	-	IN	-
Horizontal Sync Negative	-	OUT	-
Vertical Sync Positive	-	-	IN
Vertical Sync Negative	-	-	OUT



Appendix D. Skew Module

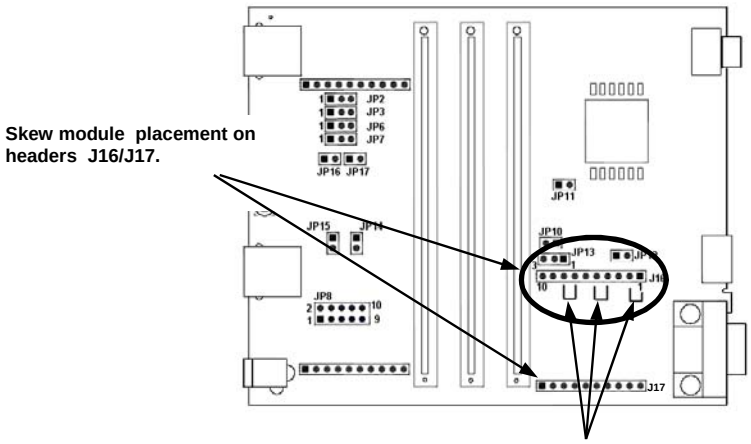
The XR2000 receivers have an optional skew compensation module that can be installed or removed.

To install the skew compensation module:

1 Remove top cover.
2 Remove the 3 jumpers from J16 pins 1-2, 4-5, 7-8.
4 Insert the Skew assembly onto the XR series PCB using 11 pin headers J16 and J17.
5 The correct orientation of the skew board is to place the side with the Magenta logo into header J17.
6 Reassemble unit.

Removal is the opposite of the above. Ensure 3 jumpers are installed in locations shown in Figure D-1.

Figure D-1.



Appendix E. Rackmounting Units

The Rackmount Kits include brackets for mounting a single transmitter, single receiver, or a single dual daisychainable receiver. Figure E-1 shows the 1-Unit Rackmount Bracket , which can be used to mount a single unit on a wall. Figure E-2 shows the 4-Unit Rackmount Bracket, which holds four units in a 19" x 1U rack.

Not shown are brackets for 6 units and brackets for AK and XR series receivers, T4 transmitters. The 3-Unit AK/XR receiver and T4 Transmitter Bracket holds 3 units in a 19" wide x 1U high panel. The 6-Unit AK/XR receiver and T4 Transmitter Bracket occupies 2U high rack space stacking 3 units atop 3 units.

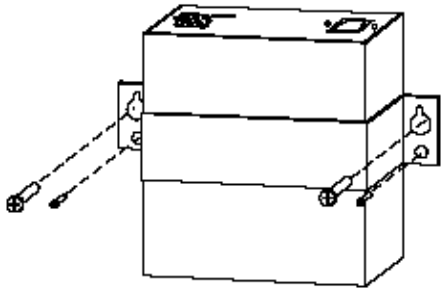


Figure E-1. Receiver Mounting Bracket.

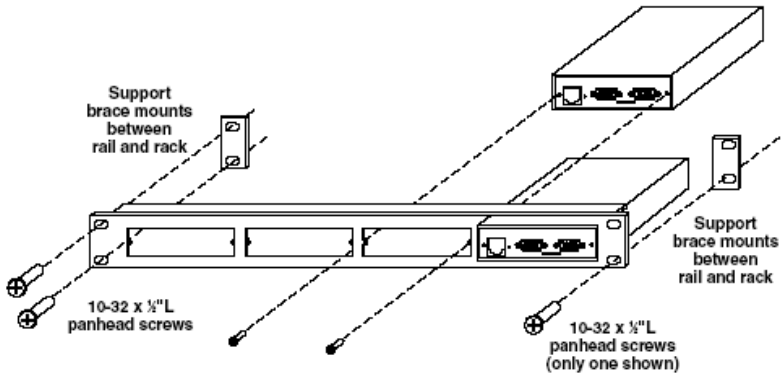


Figure E-2. Rack Mounting kit.

Appendix F. Pollable Serial Mode

The SAP pollable serial daisychainable receivers with video, audio and RS232 serial feature the ability to open a bi-directional session between a pollable transmitter and a single pollable receiver in a daisychain installation.

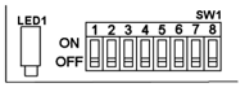
Each pollable receiver must have a unique address set first. Once this has been done, a special command (discussed below) is sent to the transmitter to specify the receiver to open a session with. Once this has been done, serial communication can occur between the RS232 source and display. The transmitter is always addressed 0.

If an address of 0 is sent, the RS232 commands will be broadcast to all receivers.

The following details the installation and setup procedure.

To set the receiver address requires that each internal serial audio daughterboard in the receiver have a unique address set. This is done via an 8 position dipswitch. Use the following chart to determine the proper switch addresses. All receivers must have a unique address. *It is recommended to write the address on each receiver once this step has been completed*. It is also recommended to keep a list of receiver addresses and locations to make it easier to determine which receiver/display is desired to communicate with.

1) Remove the top cover assembly of the receiver
2) Locate the 8 position dipswitch on the internal daughterboard assembly and using the following chart, set the receiver address.



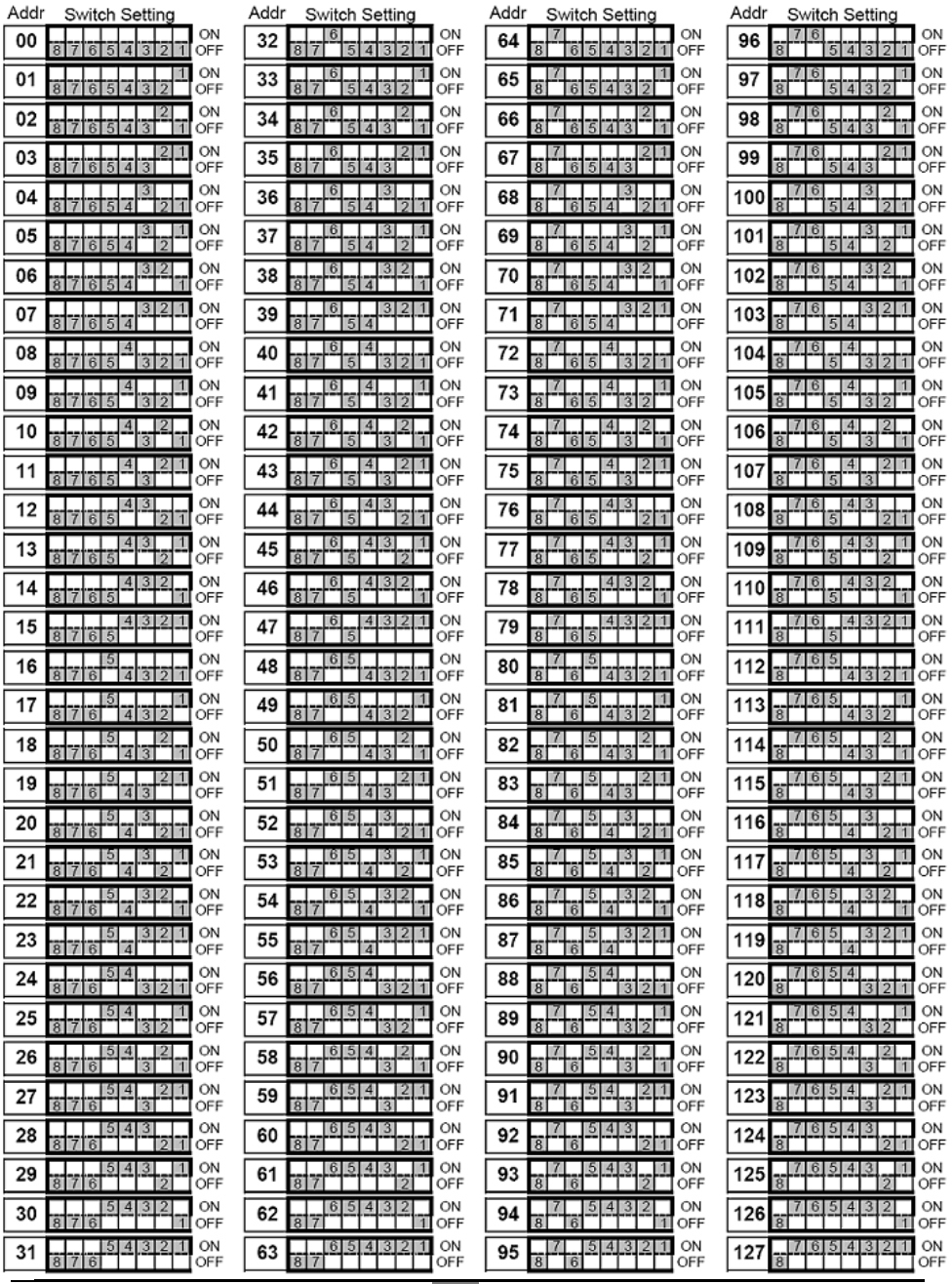
3) Replace cover assembly and install unit.
4) See below on using pollable serial mode.

In order to utilize the pollable serial mode in normal operation and connect to individual receivers, a special command needs to be sent to the transmitter in order to establish a session between transmitter and receiver.
Follow the steps below to do this (must be done from serial control application in use).

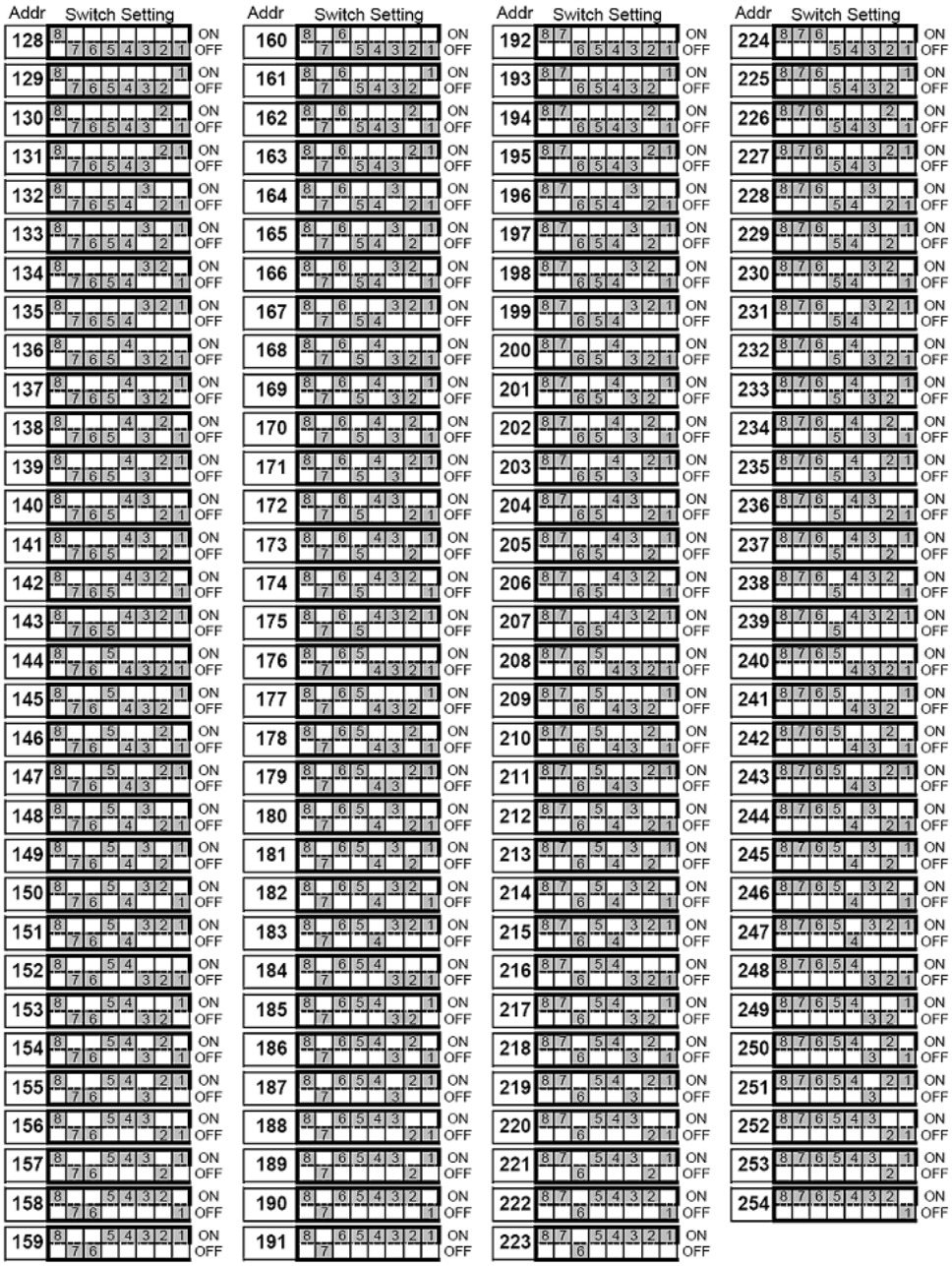
1) To establish a bi-directional RS232 session with a specific receiver, the transmitter needs the receivers address set. To do this send a CTRL-D <ID> carriage return, where <ID> is the receiver address (between 1-254)
2) To broadcast serial commands to all receivers, set <ID> to 0.
3) To disable serial communication to all receivers, set <ID> to 255 (to enable serial communication again, simply set <ID> to a receiver address).

Once a transmitter has the correct ID set, normal bi-directional communication can occur between transmitter and intended receiver.

Appendix F. Pollable Serial Mode Address Chart



Appendix F. Pollable Serial Mode Address Chart (cont.)



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